

alone being quite sufficient to convince the observer that no such dehiscence as that represented by Vaucher could take place." (!)

I shall hope in a few weeks, when the Alga is in a more advanced state, and the process fully completed, to detail the circumstances attending it at greater length; in the mean time I hasten, not merely to record a fact of importance to the algologist, but to redeem from an undeserved censure the reputation of an observer, whose admirable writings were among the first to direct attention to a department of nature which had previously been treated with comparative neglect.

Yours respectfully,

WILLIAM SMITH.

XI.—*On some new Devonian Fossils.* By FREDERICK M'COY, Professor of Mineralogy and Geology, Queen's College, Belfast.

Steganodictyum (M'Coy), n. g.

Etym. Στεγανός, *covered*, and δίκτυον, *a network*.

Gen. Char. Polymorphous, forming either narrow, rounded, branch-like masses, or extended into thin, flat, foliaceous expansions; the interior of all the forms composed of rather large, irregular, polygonal or subhexagonal cells, the three dimensions of which are approximately equal (commonly about half a line in diameter), which become rapidly smaller towards the exterior, blending with the dense covering of the surface, which is variously sculptured with close waving lines, tubercles or costæ according to the species; surface dense, foraminated by the contracted, rather distant openings of the small cell-mouths.

These curious zoophytes abound in a particular layer of dark Devonian schist near Polperro on the coast of Cornwall, and are the bodies which have been taken for fossil fishes by all previous observers—the thick reticulated fragments being quoted as “bones of *Asterolepis*,” flat sculptured portions being taken for the scaly parts of various fishes, and the midribs of some of the fronds being supposed to be “*Ichthyodorulites*, as *Diplacanthus*, *Ctenacanthus*, and Upper Silurian species of *Onchus*.” The supposed correctness of the latter identifications induced Sir R. Murchison to colour the part of the Cornish coast where these fossils occur as Upper Silurian, in his last map of that region. I first examined a good suite of these supposed Cornish fossil fishes at the Museum of Economic Geology, Jermyn Street, in company with Prof. Sedgwick last July, and at once demonstrated their true nature to Mr. Salter, who was kind

enough to allow me to examine them closely. I subsequently examined the originally figured and described specimens at the Museums of Penzance and Truro, and finally visited the localities where they are found, and procured numerous specimens, now in the Geological Museum at Cambridge, as well as examined a great quantity not worth removing. The most remarkable character of these sponges is the thin, very dense, superficial covering to the coarse cellular internal network; which however might be almost paralleled by a slice of the common large cup-sponge of Ceylon. As so many authorities for whose opinions I entertain a high respect supposed the reticulation to be the cancellated structure of bone, I thought it due to them, that transparent microscopic sections should be prepared of some of the most bone-like portions and submitted to powerful microscopes, and for this purpose I trespassed on the kindness of my friend J. Carter, Esq., of Petty Cury, Cambridge, who possesses not only an extremely fine microscope, but admirable skill in the use of it and in the preparation of the objects. I have to thank him for not only putting slices of the present fossils under a high power, but making similar slices, for comparison, of fossil bones of various animals and of sponges—the results entirely confirming the opinion I had formed from an examination with my naked eye, namely, that there was no bone-structure whatever in the Cornish fossils; which indeed was obvious enough to any one reflecting on the way in which bones grow.

Steganodictyum Cornubicum (M'Coy).

Sp. Char. Fronds forming large, flat, slightly undulating expansions, about one line thick, and several inches long and wide, with irregular broad, transverse undulations or impressions; the middle supported by a thick, simple, gradually tapering, stem-like portion, which has a thickness and width of about three lines at 4 inches from the apex; surface of stem and frond, or lateral expansions, generally dark-coloured, dense, and uniformly marked with close, equal, broad, flat, longitudinal ridges, separated by deep sulci only one-fourth or one-third the width of the ridges (about eleven ridges in the space of two lines on all parts of the surface); the direction of the ridges is irregular, being sometimes over large spaces perfectly straight and parallel, but more usually much undulated; under a strong lens the ridges are seen to be punctured by numerous minute cell-openings, from one to three irregular rows to each ridge, rather more than their diameter apart; cell-structure of the interior, coarse, polygonal, averaging six cells in the space of two lines.

The midrib of this species is often found separated from the

thin, foliaceous expansions, and has been then described as Ichthyodorulites of the genera *Onchus*, *Ctenacanthus* and *Diplacanthus*. I have however repeatedly noticed its contact with, and gradual passage on each side into, the flat, similarly striated frond.

Extremely abundant in a bed of blackish Devonian shale in Lantic and Lantivit Bays on the south coast of Cornwall near Polperro, and striking into Fowey Harbour, accompanied by occasional specimens of the *Bellerophon bisulcatus*, Röm. (the Devonian shell confounded with the Silurian *B. trilobatus* by those English geologists who have quoted that species from the British Devonian strata).

(Col. University of Cambridge.)

Stegano dictyum Carteri (M'Coy).

Sp. Char. Flattened expansions, often less than one line thick; internal cellular structure rather finer than that of the *S. Cornubicum*: surface covered with subequal, elongate oval prominent tubercles, averaging twice as long as wide (half a line long), arranged sometimes in quincunx, sometimes in irregular lines, the rows from half a line to one line apart, but usually three to four tubercles in a space of two lines; flat spaces between the tubercles marked with a parallel striation, usually oblique to the tubercles, crossing those which are but slightly elevated, but obsolete on the more prominent ones (about nine sulci in a space of one line); both tubercles and oblique sulci punctured by the openings of the minute cell-mouths, which are about their diameter apart, and averaging eight to nine in a space of one line.

This species is very much rarer than the *S. Cornubicum*, from which it is easily distinguished by its tuberculated surface. I have great pleasure in dedicating it to my friend Mr. Carter.

Rare in the dark Devonian schists of Lantivit Bay, Cornwall.
(Col. University of Cambridge.)

Uncites laevis (M'Coy).

Sp. Char. Longitudinally ovate, oblique; entering valve when young ovate, with the front and lateral margins broadly rounded, when old becoming very gibbous and subrhomboidal from the convergence of the sides to a narrow rounded front; receiving valve obtusely subcarinate along the middle when old by the nearly flat sloping of the sides, the front margin not perceptibly elevated, and the lateral margins nearly horizontal; beak very large, sharply pointed, and widely arched inwards obliquely to one side, the under part of the beak

widely channelled with obtusely angular or rounded lateral margins; surface smooth, or only marked by the concentric lines or imbrications of growth towards the margin. Length of receiving valve $2\frac{1}{2}$ inches, proportional length of entering valve $\frac{7.5}{100}$, width $\frac{6.0}{100}$, depth of both valves $\frac{5.5}{100}$. Thickness of shell in beak of receiving valve 2 lines, above the beak of entering valve on one side 5 lines, on the other side 4 lines, diminishing the cavity to 2 lines in diameter; thickness of shell about the middle of the sides of receiving and entering valve 3 lines, diminishing to little more than 1 line along the middle, and gradually thinning to the margins; length of young specimens 9 lines, proportional length of entering valve $\frac{8.0}{100}$, width $\frac{8.0}{100}$, depth of both valves $\frac{4.5}{100}$.

The general narrow elongate form, and the oblique torsion of the long, narrow, claw-like beak in this species, exactly reminds us of the *Uncites gryphus* of DeFrance, from which it is distinguished by the absence of the longitudinal sulcation. Having first ascertained the true internal characters of that curious Eifel fossil, it gave me great pleasure to recognise in our British rocks a second species of this remarkable genus. I should have imagined that the *smaller* of the two figures given in Sowerby's 'Mineral Conchology' under the name of *Terebratula porrecta* represented a young individual of this species, on account of the narrow produced front, but as Mr. Sowerby himself has since stated (G. T. 2 S. vol. v. expl. of t. 56) that those figures represented the *Strigocephalus Burtini*, and as all writers seem to coincide in that opinion, I have only to observe, that the present fossil, by the complete absence of internal septa, and the external characters above enumerated, has no affinity whatever therewith.

Not uncommon in the Devonian limestone of Newton Bushel, Devonshire.

(Col. University of Cambridge.)

Orthis persarmentosa (M'Coy).

Sp. Char. Transversely oblong, hinge-line nearly the length of the shell, ends obtusely subtruncate, slightly rounded; surface covered with thick, rugged, rounded, flexuous, radiating ridges, about half their thickness apart (about five in three lines in the middle of the shell at six lines from the beak), branching four or five times between the beak and margin, counting about 130 at the margin of a large specimen, those towards the sides straighter and finer than those in the middle. Average width 3 inches; length probably one-third of the width, but cannot be stated accurately, owing to the distortion of all the specimens.

This species very closely resembles the *O. sarmentosa* (M'Coy) of the older rocks in form, and the peculiar twig-like mode of branching of the ribs on the middle of the shell, and the straighter and finer one of the sides, but is distinguished by the very much greater number of the ridges. As in the case of that species the distortion is usually such, that I can make no probable approximation to the proportional length. The coarseness of the ridging separates the present species from the American *Strophomena nervosa* and *S. bifurcata* (Hall) of the Chemung group.

Common in the Devonian shale of Polruan, Cornwall; in the reddish Devonian schists of E. Looe; schists of Fowey.

(Col. University of Cambridge.)

Strophomena gigas (M'Coy).

Sp. Char. Rotundato-trigonal; hinge-line equal to the width of the shell; sides gently convex, converging to a narrow, much-rounded front; valves much flattened, slightly convex; surface radiated with very numerous fine, close, obtuse striæ, separated by narrower finely punctured impressed lines, every fifth, seventh, or ninth of which seem larger than the rest, about sixteen striæ in two lines at an inch from the beak, fifteen in the same space at the margin 3 inches from the beak; cardinal area broad: internal casts of receiving valve in adult specimens show the pair of muscular impressions, forming a slightly bilobed or subtrigonal mass, about one-third wider than long, and reaching rather more than one-third the length of the shell, each side marked with six or seven very coarse radiating ridges; mesial septum very small. Average length 3 inches 2 lines, proportional width $\frac{95}{100}$ to $\frac{100}{100}$, width of cardinal area nearly 2 lines. •

This gigantic species in its elongate-elliptical or subtrigonal form, arising from the narrow rounded front, precisely agrees with *Orthis subarachnoides* of MM. D'Archiac and De Verneuil (Geol. Trans. 2 S. vol. vi. t. 36. f. 3), but differs from it in the larger striæ at subregular intervals between the group of smaller, as well as its great size. I have seen and made drawings of a large number of specimens in the private collections of persons at or near Looe, although there is only one indifferent specimen in the University collection; I am therefore better prepared to decide on the characters of the species than I should otherwise have been.

Common in the Devonian shale of Looe, and of Polruan, Cornwall.

(Col. University of Cambridge.)

Strophomena nobilis (M'Coy).

Sp. Char. Semicylindrical ; entering (?) valve very gibbous near the beaks, strongly arched downwards into a subcylindrical deflected front, the sides of which are slightly flattened to join the obscurely defined ears, which project from the gibbous beak, and are nearly rectangular ; front rounded : surface radiated with narrow distinctly defined ridges, of about equal thickness throughout ; about twenty originating from the beak, between each pair of which, after about the length of 1 inch, a new ridge equal to the primaries in size is developed, so that nearly over the whole shell the subequal ridges are little more or less than a line apart ; the intervening spaces slightly concave, three times wider than the ridges, crossed by very deep, strong, irregularly curved concentric wrinkles, not crossing the ridges, scarcely four in a longitudinal space of three lines ; entire surface, ridges and furrows marked with very fine slightly irregular longitudinal distant striæ, nine in the space of 1 line, strongly punctured when the outer layer of shell is removed. Width at hinge-line 2 inches 4 lines, proportional length about the same, depth (greatest at one-third from the beak) $\frac{6.5}{100}$.

This fine species is so completely unlike any other, that it is unnecessary to point out the distinctions ; the nearest analogue apparently being the comparatively little, flat, few-ribbed *Orthis undulata* (M'Coy, Synopsis of the Silurian Fossils of Ireland, t. 3. f. 22. of the Silurian Series), with which however it has no specific affinity.

Devonian limestone of Torquay.

(Col. University of Cambridge.)

Leptodomus constrictus (M'Coy).

Sp. Char. Oblong, or subtrigonal from the projection of the very prominent beaks ; valves very tumid towards the anterior side, greatest depth at about one-third from the beak, anterior end subtruncate, projecting but slightly towards the ventral portion beyond the line of the beaks ; anterior lunette very large, ovate, deep, smooth ; a deep narrow sulcus extends from the beak, slightly widening to the nearly straight ventral margin, which it meets at about 50° , forming a small sinus ; posterior side much compressed, posterior slope not defined, posterior end obtusely subtruncate with a slight obliquity ; hinge-line straight, rather shorter than the posterior side ; anterior side and middle of the valves deeply marked with coarse concentric wrinkles, arising from the edge of the smooth anterior lunette, and most of them becoming abruptly obsolete on the posterior

half of the shell; those near the margin of old specimens about one line wide, gradually diminishing towards the beak. Length 1 inch 2 lines, proportional width from beak to opposite ventral margin $\frac{77}{100}$, length of anterior lunette $\frac{57}{100}$, width of posterior end about $\frac{65}{100}$, depth of one valve about $\frac{40}{100}$.

This species in size, shape, subtruncate anterior end, and coarse concentric wrinkles of the anterior half becoming obsolete on the posterior portion, almost exactly resembles the *L. truncatus* (M'Coy) of the Upper Ludlow rock, but may be distinguished easily by the strong divisional sulcus from the beak. I suspect the fossil from Baggy Point, referred by Phillips (Pal. Foss.) to the Silurian so-called *Cypricardia impressa* of Sowerby, may be found to belong rather to the present species.

One young specimen, 5 lines long, of the left valve, and two large specimens in opposition of the right valve, have occurred in the "yellow sandstone" of Marwood, N. Devon.

(Col. University of Cambridge.)

Clymenia quadrifera (M'Coy).

Sp. Char. Discoid, compressed, nearly two-thirds of the whorls concealed; whorls about four and a half, crossed by very minute sigmoid striæ; periphery* narrow, obtusely rounded; septa with the middle portion crossing the periphery small; *first sinus* small, oblique, very obtusely rounded; first lobe nearly in the middle of the side, nearly square, slightly rhomboidal, length and width about equal, truncated at the broad extremity, the angle next the umbilicus rather more obtuse, and the other slightly more acute than a right angle, sides subparallel; second sinus slightly higher than the first, extending with scarcely any curvature to the umbilicus, its width double that of the lateral lobe, which is placed nearly in the middle of the side; dia-

* In descriptions of discoid Cephalopod shells, as Ammonites, &c., conchologists almost invariably use the terms "*back* or *dorsal*, and *ventral*," exactly in the opposite sense to what anatomy or the position of the animal would indicate. I therefore propose to use the term "*periphery*" for that part commonly called by describers of these shells the "*back*," or by anatomists the "*ventral aspect*," as the use, at this late period, of the latter term would bring much unnecessary confusion into the descriptions; for the opposite edge of the mouth I use the term "*inner edge*." In describing the septa of the same shells and for the same reason, instead of "*dorsal lobe*" I use the term "*mid-lobe*," or "*inner mid-lobe*," for the so-called "*ventral lobe*" of Von Buch and all other describers. Instead of "*first lateral superior*, *first lateral inferior*, and *first*, *second*, &c. *auxiliary lobes*," terms which are unnecessarily complex, I propose to number and describe the lobes simply as *first lobe*, *second lobe*, *third lobe*, &c., reckoning from the outer *mid-lobe*, or, as it has usually been called, the *dorsal lobe*. The word *sinus*, I think, may be used instead of *saddle* for the inflexion between each pair of lobes.

meter 1 inch 3 lines, proportional diameter of last whorl $\frac{54}{100}$, width of mouth at edge of umbilicus $\frac{51}{100}$, width of periphery about $\frac{17}{100}$.

This species is easily distinguished from all others by the remarkably defined, nearly square form of the lateral lobe. It is most allied to the *Clymenia striata*, Münster, from which it is easily distinguished by the very obtusely rounded, obscurely defined first sinus, and the regular, almost square-formed lobe and the scarcely curved margin of the second sinus; the cast of that species is also marked by sigmoid ridges, of which there is not the slightest trace on the second species. I have seen traces both of the *evanescent* thread-like middle and lateral keels occasionally noticed on the other species.

Very rare in the limestone of S. Petherwin.

(Col. University of Cambridge.)

Clymenia Pattisoni (M'Coy).

Sp. Char. Discoid, compressed, of about five whorls, rather more than one-third of each being concealed by the preceding turn; section of the whorls semielliptical, greatest thickness near the edge of the umbilicus, which is considerably wider than the whorl; sides very slightly convex, gradually converging to the obtusely rounded periphery, to which there is often super-added a very fine thread-like mesial keel and two lateral ones; surface finely striated transversely; siphon large, close to the inner margin; septa about one-third the width of the side apart, with the middle portion nearly transverse, no lateral lobe, but the edges after about the middle of the side arching backwards and then forwards again to the edge of the umbilicus, forming an obtusely rounded first sinus, which extends backwards about half the space between the septa farther than the middle portion. Diameter 9 lines, proportional diameter of umbilicus $\frac{48}{100}$, of last whorl $\frac{40}{100}$, width of mouth $\frac{25}{100}$.

This species belongs to that very restricted first group of *Clymenia* according to Münster, in which the edges of the septa are only slightly arched; it is most nearly allied to the *C. compressa*, Münster, from which however, on comparing with authentic specimens, I find it differs by the great size of the umbilicus, which in that species is much less than the last whorl, forming scarcely $\frac{30}{100}$ of the entire diameter. The septa differ from all of this group in the greater forward curvature of the umbilical end of the edge of the septa, thus forming a distinct rounded *sinus*, from which the edge passes with very little curvature across the outer half of the sides and periphery, forming no

lateral lobe or medial saddle (*sinus*) as in the other allied forms; this flexion forward to the umbilicus distinguishes this part very strongly from *C. levigata*, which also has very much more numerous whorls and larger umbilicus. I have much pleasure in dedicating this species to Mr. Pattison of Launceston, to whose labours in collecting, I believe, are due the discovery of nearly all the British specimens of *Chymenia*.

Rare in the Devonian limestone of S. Petherwin.

(Col. University of Cambridge.)

Cyrtoceras subornatum (M'Coy).

Sp. Char. Gradually arched, involute; section of the whorls a regular transverse ellipse, the shortest axis in the plane of involution, tapering at the rate of 5 lines in 2 inches from a diameter of 1 inch 5 lines; periphery broadly arched, inner face rather more convex; sides elliptically rounded, with an obscure spiral ridge on each side along the most prominent part, bearing a row of large obtuse conical tubercles, nearly twice their diameter apart; on each side of this principal row of tubercles is a secondary obscure row, about half as far from the principal ridge as the tubercles of it are from each other, the outer of these rows most distinct, the inner nearly obsolete; these three sets of tubercles are connected by very obscure transverse wrinkles, which do not extend beyond them across the inner aspect, or the periphery; entire surface crossed by very minute, imbricating waving lines of growth having a very obtusely angular backward sinus in the middle of the periphery, all crossed by very faint longitudinal folds half a line apart, never assuming the prominence of striæ or ridges; siphon close to the outer margin. Proportional length of mouth as compared to the width $\frac{80}{100}$.

This beautiful species is most nearly allied in form, size, septa, siphon and striation to the *C. ornatum* (Goldf.), as figured by D'Archiac and De Verneuil in the 'Geol. Trans.' vol. vi. t. 28. f. 5, but is rather less rapidly curved, and is completely distinguished by the two or three rows of tubercles being very small, and entirely confined to the sides, leaving the broad periphery completely free of them.

One fragment in the Devonian limestone of Plymouth.

(Col. University of Cambridge.)